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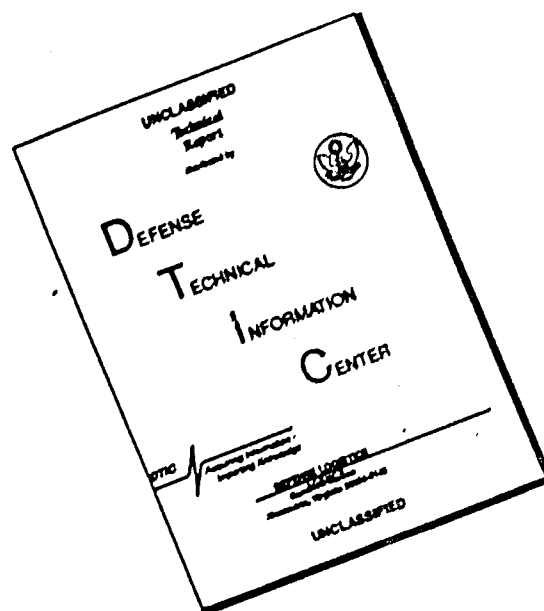
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HEADQUARTERS
UNITED STATES CONTINENTAL ARMY COMMAND
FORT MONROE, VIRGINIA

QUIS

ATDEV-3 472

23 October 1961

SUBJECT: Report of Project Nr 2920, Service Test of Plastic Stocks for Rifle, 7.62mm, M14

TO: Chief of Research and Development
Department of the Army
Washington 25, D. C.

N-62-1-1
NOX

1. Inclosed is a copy of subject report prepared by the US Army Infantry Board.
2. This headquarters agrees with the Infantry Board and concludes that:
 - a. The plastic stock is suitable for Army use with the Rifle, 7.62mm, M14.
 - b. The plastic stock is interchangeable with, and can be used as a substitute for, the standard item now in production.
 - c. No significant problems are expected from the test stock when subjected to the normal stress of a parachute landing fall.
3. This headquarters recommends that:
 - a. The plastic stock for the Rifle, 7.62mm, M14, be type classified Standard A for Army use.
 - b. The plastic stock for the Rifle, 7.62mm, M14, be adopted as a suitable substitute for the standard item now in production.
 - c. Effort be continued to eliminate the shortcomings listed in Annex B of attached report.
4. It is requested that this headquarters, ATTN: Deputy Chief of Staff for Materiel Developments, be notified of action taken.

FOR THE COMMANDER:

1 Incl
(over)

L. L. Stewart
LEE L. STEWART
Lt Colonel, AGC
Asst Adjutant General



1 Incl
USAIB Rept of Proj Nr 2920,
29 Sep 61, w/Anx A-C

Copies furnished:
G

UNITED STATES ARMY INFANTRY BOARD
Fort Benning, Georgia

29 September 1961

REPORT OF PROJECT NO 2920
SERVICE TEST OF PLASTIC STOCKS
FOR RIFLE, 7.62mm, M14

1. AUTHORITY.

a. Directive. Ltr, ATDEV-3 474, Hq USCONARC, 9 May 1961, subject: "Service Test of Plastic Stocks for Rifle, 7.62mm, M14."

Investigation was undertaken
b. Purpose. To determine the suitability of plastic stocks for Rifle, 7.62mm, M14, for Army use under temperate environmental conditions.

2. REFERENCES.

a. DA Project No 502-08-006.

b. CDOG Subparagraph No: 237a(1).

c. OTCM Item 34142, Office, Chief of Ordnance, DA, 27 Mar 52, subject: "Rifle, Caliber .30, Lightweight-Military Characteristics."

d. Ltr, ATBC, US Army Inf Bd, 3 May 60, subject: "Evaluation of Plastic Stocks for the M14 Rifle."

e. Ltr, ATBC, US Army Inf Bd, 10 Jun 60, subject: "Evaluation of Plastic Stocks for the M1 Rifle."

f. Ltr, ATDEV-3 474/5(C)(16 Jun 60), Hq USCONARC, 16 Jun 60, subject: "Report of Test of Project No ATB 3-60, 'Confirmatory Test of Production Model Rifle, 7.62mm, M14 with Accessories' (DA Project No 502-08-006)(U)."

g. Ltr, ATBC, US Army Inf Bd, 12 Jul 60, subject: "Plastic Rifle Stocks," with 2 indorsements.

3. DESCRIPTION OF MATERIEL.

a. Test. Plastic stocks for Rifle, 7.62mm, M14, hereinafter referred to as the test stocks, were received 27 April 1961. The test stocks are fabricated from fiberglass material and cut fibers. The test stocks are molded in two halves and then assembled in a fixture using an epoxy resin adhesive for binding. To provide additional strength of binding, three knurled aluminum pins are used in assembly of the two halves. These pins are inserted in opposing oversize holes filled with epoxy resin adhesive in each half of the stock. The pins are employed merely to provide additional shear area for the adhesive. Small overlays of glasscloth are then

placed over the seam. Each half of the test stock consists of three layers of 1½ ounces of glass material pre-impregnated with colored polyester resin. Pre-mix compound is placed in specified locations in measured amounts. After assembly, urethane rigid foam is placed in the cavity in the butt end of the stock. The space required in the butt of the stock for maintenance equipment is formed by mandrels inserted before foaming. The finish of the stock consists of two coats of paint, both pigmented walnut brown. The undercoat is an epoxy polyamide primer over which is placed an urethane top coat. Oven baking is required for the urethane rigid foam in the butt of the stock and for both paint coat finishes.

b. Control. The standard wood stock for the Rifle, 7.62mm, M14 was used as the control stock.

c. Maintenance package was not received.

4. BACKGROUND.

a. Plastic rifle stocks are being developed as a substitute for wood stocks for two reasons. First, there is a requirement to avoid, where possible, being committed to a single source of supply or a single class of material. Second, supplies of walnut wood for stock blanks fluctuate both as to quantity and quality. Currently, the trend in wood stocks is upward in cost and downward in quality. It is anticipated that plastic stocks will last twice as long as wood stocks; the materials used to make the plastic stocks are not likely to become critical, even during periods of national emergency; and overall, the plastic stock will be competitive in cost with the wood stock. Plastic rifle stocks for the M14 and M1 rifles were evaluated by this Board in 1960 and, although discrepancies were found in these stocks, they were recommended for further development and test by this Board (ref 2d and e).

b. This item is not proposed for Tripartite Standardization.

5. SUMMARY OF TESTS.

a. Physical Characteristics. The test and control stocks were comparable in size and configuration (Annex C-1). The test stocks averaged .10 pound lighter and were more uniform in weight than the control stocks.

b. Effects upon Weapon Accuracy. The accuracy of the M14 rifle equipped with the test and control stocks was comparable.

c. Effects upon Weapon Functioning. The use of the test stocks had no apparent adverse effects upon the functioning of the M14 rifle.

d. Durability. The durability of the test stocks was considered satisfactory. Small cracks developed on the test stocks along the bonded seam which joined the two halves. This lack of durability of the bonded seam was considered a shortcoming.

e. Adverse Conditions. Exposure to various adverse conditions had no apparent effect on the test stocks; however, both the test and control stocks burned when exposed to open flames.

f. Retention of Heat. The heat retention characteristic of the test stock was considered satisfactory. During the firing the test stocks became hotter than the control stocks; however, the test stocks were not sufficiently hot to affect firing or to cause serious discomfort to the firer. When placed in direct sunlight in an ambient temperature of 95°F for 2 hours, a test stock required a cool-off period of 2 minutes before it could be comfortably handled, whereas the control stocks never became too hot to be comfortably handled.

g. Suitability for Mounting the M15 Grenade Sight. The test stocks were suitable for mounting the M15 grenade sight.

h. Aerial Delivery. Testing to determine the capability of the plastic stock to withstand the stress of a parachute landing fall by a parachutist has not been completed. This test will be continued and an addendum to this report of test will be submitted at a later date.

6. CONCLUSIONS. The US Army Infantry Board concludes that:

a. The plastic stock is suitable for conventional Army use with the Rifle, 7.62mm, M14, under temperate environmental conditions.

b. The plastic stock is interchangeable with and can be used as a substitute for the standard item now in production.

7. RECOMMENDATIONS. It is recommended that:

a. The adoption and type production of the plastic stock for the Rifle, 7.62mm, M14, for conventional Army use under temperate environmental conditions be decided on the basis of technical considerations including, but not limited to, the single source of material supply, the criticality of materials, the life of plastics, the ease of manufacture, and the ultimate cost.

b. If adopted, efforts be continued to eliminate the shortcomings listed in Annex B.

ANNEXES

- A. Details of Test
- B. Findings
- C. Photographs (C-1 and C-2)

William M. Summers

WILLIAM M. SUMMERS
Colonel, Infantry
President

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ANNEX A - DETAILS OF TEST

Report of Project No 2920

TEST NO 1, PHYSICAL CHARACTERISTICS.

1. PURPOSE. To determine and compare the physical characteristics of the test and control stocks.

2. METHOD. The test and control stocks were inspected, weighed, measured, and photographed, and the results were recorded.

3. RESULTS.

Stock No for Identification		Length of Stock (Inches)		Width of Stock at Butt Plate Hinge (Inches)		Depth of Stock Measured at Butt End (Inches)		Weight of Stock (Pounds)	
Test	Control	Test	Control	Test	Control	Test	Control	Test	Control
1	1	32 15/16	33	1 7/8	1 3/4	5 7/8	6	2.52	2.42
2	2	33	32 15/16	1 7/8	1 3/4	5 7/8	6 1/4	2.55	2.88
3	3	32 15/16	32 15/16	1 7/8	1 3/4	5 7/8	6 3/16	2.52	2.53
4	4	32 15/16	32 15/16	1 7/8	1 3/4	5 7/8	6 1/8	2.53	2.62
5	5	32 15/16	33	1 7/8	1 3/4	5 7/8	6 1/16	2.52	2.60
6	6	33	33	1 7/8	1 3/4	5 7/8	6 1/16	2.49	2.82
7	7	33	33	1 7/8	1 3/4	5 7/8	5 15/16	2.51	2.46
8		33		1 7/8		5 7/8		2.52	
9		33		1 7/8		5 7/8		2.54	
10		32 15/16		1 7/8		5 7/8		2.51	

4. ANALYSIS. The test and control stocks were comparable in size and configuration. The test stocks averaged .10 pound lighter and were more uniform in weight than the control stocks.

TEST NO 2, EFFECTS UPON WEAPON ACCURACY.

1. PURPOSE. To determine if the test stocks have any adverse effects upon the accuracy of the weapon.

2. METHOD.

a. Using five M14 rifles equipped with test stocks (T-1, 2, 3, 4, and 5) for which the zero had been determined, and firing from a bench rest, each of three experienced firers fired three 10-round shot groups semiautomatically (slow fire) at 200 meters.

b. The exercise in a above was repeated with five M14 rifles equipped with control stocks (C-1, 2, 3, 4, and 5).

c. The M14 rifles were rotated until each firer had fired all five rifles equipped with both test and control stocks.

d. After Tests No 3, 4, 5, and 6 were completed, the exercises in a, b, and c above were repeated using three test stocks and one control stock. This was necessary as four control and two test stocks had been broken during the conduct of this service test.

e. The center of impact, maximum spread, and mean radius were computed and recorded for each shot group. The average of these measurements was determined for the M14 rifles equipped with test and control stocks. Separate computations were made and compared with the results obtained initially and for the results obtained after Tests No 3, 4, 5, and 6.

3. RESULTS.

a. Shown below are the results of accuracy firing conducted prior to Tests No 3, 4, 5, and 6:

Stock No for Identification	F I R E R					
	A		B		C	
	Maximum Spread (Feet)	Mean Radius (Inches)	Maximum Spread (Feet)	Mean Radius (Inches)	Maximum Spread (Feet)	Mean Radius (Inches)
1 Control	1.16	5.1	1.15	4.4	.90	3.6
2 Control	1.46	5.9	1.26	5.1	1.39	5.6
3 Control	1.42	5.5	1.44	5.5	1.12	4.8
4 Control	1.61	5.8	.84	3.5	1.15	4.5
5 Control	.88	3.6	1.45	5.3	1.18	4.8
AVERAGE CONTROL	1.31	5.2	1.23	4.8	1.15	4.7
1 Test	1.22	4.6	1.15	4.8	1.03	3.9
2 Test	1.05	4.0	1.44	5.5	1.10	4.7
3 Test	1.21	4.9	1.10	4.5	1.06	4.2
4 Test	1.30	5.0	1.17	4.8	1.45	5.6
5 Test	1.13	4.2	1.79	7.4	1.32	4.9
AVERAGE TEST	1.18	4.6	1.33	5.4	1.19	4.7

All Firers All Weapons	Maximum Spread	Mean Radius
Test	1.23	4.9
Control	1.23	4.9

b. Shown below are the results of accuracy firing conducted after the completion of Tests No 3, 4, 5, and 6:

Stock No for Identification	F I R E R					
	A		B		C	
	Maximum Spread (Feet)	Mean Radius (Inches)	Maximum Spread (Feet)	Mean Radius (Inches)	Maximum Spread (Feet)	Mean Radius (Inches)
T-1	1.28	5.0	1.13	4.9	1.17	4.8
T-2	2.21	8.5	1.25	5.5	1.40	5.0
T-4	1.37	5.3	1.16	4.6	1.10	4.4
AVERAGE						
TEST	1.62	6.3	1.18	5.0	1.22	4.7
C-3	1.35	5.2	1.39	6.3	1.24	4.7

All Firers All Weapons	Maximum Spread	Mean Radius
Test	1.33	5.4
Control	1.34	5.3

c. The following additional stock wear was noted after firing exercise b above:

<u>Rounds Fired</u>	<u>Stock No</u>	<u>Remarks</u>
90	T-1	A crack was observed at the center of the bridge of the magazine recess.
90	T-4	A crack was observed extending for 3 3/4 inches from the stock ferrule along the seam.

4. ANALYSIS. The accuracy of the M14 rifle equipped with the test and control stocks was comparable.

TEST NO 3, EFFECTS UPON WEAPON FUNCTIONING.

1. PURPOSE. To determine if the test stocks have any adverse effects upon the functioning of the weapon.

2. METHOD. During all test firing, a record was kept of the type and number of weapon malfunctions which occurred when using test and control stocks.

3. RESULTS. Totals of rounds fired from M14 rifles equipped with test and control stocks during all tests were 23,946 and 21,710 rounds, respectively. Malfunctions and parts breakage data were as follows:

<u>MALFUNCTION DATA</u>	<u>TEST</u>	<u>CONTROL</u>
Failure to Feed	33	50
Failure to Extract	25	28
Failure to Fire	9	2
Broken Firing Pin	1	2
Broken Extractor	<u>0</u>	<u>1</u>
Totals	68	83

4. ANALYSIS. The use of the test stocks had no apparent adverse effects upon the functioning of the M14 rifle.

TEST NO 4, DURABILITY.

1. PURPOSE. To determine and compare the durability of the test and control stocks.

2. METHOD.

a. Three M14 rifles equipped with test stocks (T-1, 2, and 3) and three M14 rifles equipped with control stocks (C-1, 2, and 3) were used to:

(1) Execute 200 repetitions of order arms from port arms.

RESULT: No adverse effects were noted on either the test or control stocks.

(2) Break the soldier's fall when assuming the prone firing position from a run (100 repetitions).

RESULT: No adverse effects were noted on either the test or control stocks.

(3) Fire semiautomatically (slow fire) for a minimum of 3,000 rounds.

RESULT: The following stock wear was noted after the rounds indicated had been fired:

<u>Rounds Fired</u>	<u>Stock No</u>	<u>Stock Wear</u>
800	T-3	Crack inside near the front sling swivel bracket along the seam.
1600	C-2	Crack along top of right side of stock where operating rod was hitting (stock did not fit).

<u>Rounds Fired</u>	<u>Stock No</u>	<u>Stock Wear</u>
1900	C-1	Crack inside near the stock ferrule.
3000	T-1	Butt plate screw holding lower sling swivel loosened.
3000	T-2	Two cracks on the inside just below the stock ferrule $\frac{1}{2}$ inch long along seam. Crack on left side (inside) of receiver compartment.
3000	T-3	Butt plate screw holding lower sling swivel loosened. Crack at the rear of receiver compartment.

(4) Fire automatically (maximum rate not to exceed 20 rounds per minute) for a minimum of 3,000 rounds.

RESULT: The following additional stock wear was noted after the rounds indicated had been fired:

<u>Rounds Fired</u>	<u>Stock No</u>	<u>Stock Wear</u>
3000	T-1	Crack on the right side of the small of the stock.

(5) Fire semiautomatically for 5 minutes at a rate of 40 rounds per minute.

RESULT: No adverse effects were noted on either the test or control stocks.

(6) Fire semiautomatically for 30 minutes at a rate of 15 rounds per minute.

RESULT: The following stock wear was noted after firing the exercise:

<u>Rounds Fired</u>	<u>Stock No</u>	<u>Stock Wear</u>
450	T-2	Small blisters on surface of forward top ridge of stock where heat was intense.

(7) Fire automatically in short bursts of 2-3 rounds, repeating firing described in (5) and (6) above.

RESULT: The following additional stock wear was noted after firing the exercise:

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Stock NoStock Wear

T-1

Upper sling swivel loosened.

T-3

Five small cracks on left side of flange forward of the balance on top of stock 1/16 inch to 3/16 inch and 2 1/4 inches to 5 inches below the stock ferrule.

C-1

Small crack at forward edge of stock near the stock ferrule.

C-3

Upper sling swivel loosened.

(8) Launch 100 rifle grenades (M29 Practice Rifle Grenades) with the butt of the weapon supported by hard packed earth.

RESULT: The following stock wear was noted after firing the number of rounds indicated:

Rounds FiredStock NoStock Wear

60

T-1

Crack 1/2 inch long on forward edge of receiver compartment.

60

T-2

Crack on left side of receiver extending down to shelf.

60

T-3

Additional cracks noted on the left side of the flange where the five small cracks appeared before. (See Test No 4, para 2a(7))

100

T-1, T-2,
T-3

All hinged butt plates were slightly bent and the hinge joint raised on T-1 and T-3 so that it protruded slightly above the line of the comb of the stock.

100

C-1, C-2,
C-3

Small cracks on the right side of receiver where the metal plate on the inside of the receiver compartment is fastened.

(9) Execute 50 vertical and 50 horizontal butt strokes against a butt stroke dummy.

RESULT: The following stock wear was noted:

Stock NoStock Wear

C-1

Broke at small of stock after executing 3 horizontal butt strokes. No vertical butt strokes were executed (Annex C-2).

Stock NoStock Wear

C-2

Broke at small of stock after executing 7 horizontal butt strokes. No vertical butt strokes were executed (Annex C-2).

C-3

No visual effects noted after completing 50 vertical butt strokes. No horizontal butt strokes were executed.

T-1

No visual effects noted after completing 50 vertical butt strokes. Split along bottom seam of stock extending $2\frac{1}{2}$ inches forward of the butt plate and a $\frac{1}{2}$ inch crack on outside of stock at the stock ferrule after 9 horizontal butt strokes (Annex C-2).

T-2

No visual effects noted after completing 50 vertical butt strokes. No horizontal butt strokes were executed.

T-3

Split along bottom seam at small of stock. Broke after executing 29 horizontal butt strokes. No vertical butt strokes were executed (Annex C-2).

b. During the conduct of all tests daily checks were made to determine if oil, bore cleaner, or any other standard cleaning solution had a harmful effect upon the test stock.

RESULT: No adverse effects were noted on the test stocks.

c. Three M14 rifles equipped with test stocks (T-1, 2, and 3) and three M14 rifles equipped with control stocks (C-1, 2, and 3) were disassembled into three major groups and then assembled (500 repetitions per weapon).

RESULT: No adverse effects were noted on either the test or control stocks.

d. Three test stocks (T-1, 2, and 3) and three control stocks (C-1, 2, and 3) were statically dropped from a height of $3\frac{1}{2}$ feet and allowed to impact onto a wooden surface in different attitudes (five repetitions per stock).

RESULT: No adverse effects were noted on either the test or control stocks.

e. Loaded magazines were inserted and removed from three M14 rifles equipped with test stocks (T-1, 2, and 3) and three M14 rifles equipped with control stocks (C-1, 2, and 3) (500 repetitions per weapon).

A

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RESULT: No adverse effects were noted on either the test or control stocks.

f. Three soldiers armed with M14 rifles equipped with test stocks (T-1, 2, and 3) and three soldiers armed with M14 rifles equipped with control stocks (C-1, 2, and 3) ran the infiltration course to determine the effects of rough usage on the stock surfaces caused by crawling on grassy, rocky, and sandy soils, and by movement through briars and brush.

RESULT: Minor surface scratches caused by barbed wire obstacles were observed on all of the test and control stocks.

g. Three M14 rifles equipped with test stocks (T-1, 2, and 4) and two M14 rifles equipped with control stocks (C-3 and 6) were carried on the bed of a 2½ ton truck moving at speeds of 5 to 35 miles per hour over unimproved and improved roads for a time period of 2 hours.

RESULT: The following stock wear was noted:

<u>Stock No</u>	<u>Stock Wear</u>
C-3	A gouge ¼ inch in diameter was noted on the right side of the stock under the operating rod handle. The stock was rubbed and scored in several places.
C-6	Rubbed and scored in several places.
T-1, T-2, and T-4	Minor surface scratches and flaking of finish.

h. One test stock (T-7) and one control stock (C-6) were submerged under water for a period of 24 hours. The stocks were weighed before submergence, immediately upon removal from the water, and 24 hours after removal from the water.

RESULT: The weight of the stock assemblies was as follows:

<u>Test Stock No</u>	<u>Weight (Pounds)</u>		<u>Control Stock No</u>	<u>Weight (Pounds)</u>
T-7	2.52	Before submerging in water	C-6	2.84
T-7	2.55	After removal from water	C-6	3.10
T-7	2.53	24 hours after removal from water	C-6	2.90

1. One M14 rifle equipped alternately with test stock T-2 and control stock C-3 was dropped from the top of an M59 armored personnel carrier onto a grass surface and then onto a concrete surface to impact the butt, the right side, and the left side.

RESULT: The following stock wear was noted:

Grass Surface

<u>Stock No</u>	<u>Point of Impact</u>	<u>Stock Wear</u>
C-3	Butt of stock	None
C-3	Right side of stock	None
C-3	Left side of stock	Splits and cracks extending from the small of stock towards butt plate. This stock was then unserviceable and was not dropped on concrete.
T-2	All three positions	None

Concrete Surface

<u>Stock No</u>	<u>Point of Impact</u>	<u>Stock Wear</u>
C-8*	Butt of stock	Hinge butt plate broke off hinge butt plate assembly. Crack in right side of stock extending 2 inches from butt plate forward. Crack at base of heel in center of stock 1 inch long.
C-8*	Left side of stock	Crack in left side of stock from stock ferrule back $4\frac{1}{2}$ inches. Crack in left side of stock from the stock ferrule swivel back 6 inches.
C-8*	Right side of stock	Not dropped because of damage from two previous drops.
T-2	Butt of stock	Chip approximately 1 inch long near butt plate hinge.
T-2	Right side of stock	None
T-2	Left side of stock	None

*Stock used for this phase of test only as remainder of control stocks were damaged or broken.

j. Three M14 rifles equipped with test stocks (T-1, 2, and 4) were carried by individuals through the close combat course.

RESULT: No adverse effects were noted on the test stocks.

3. ANALYSIS. The durability of the test stocks was considered satisfactory. Most of the damage to the test stocks caused by wear consisted of small cracks which occurred along the bonded seam joining the two halves principally in the area extending from the stock ferrule through the upper sling swivel bracket (Annex C-2). Although small cracks developed on the test stocks during the conduct of the test, all of the test stocks were considered serviceable at the conclusion of all tests with the exception of one stock which was broken while executing the horizontal butt stroke. None of the three control stocks survived the durability testing.

TEST NO 5, ADVERSE CONDITIONS.

1. PURPOSE. To determine if any damage or harmful effects result when the test and control stocks are subjected to adverse conditions.

2. METHOD.

a. Two M14 rifles equipped with test stocks (T-1 and 2) and two M14 rifles equipped with control stocks (C-1 and 2) were placed in:

(1) A hot chamber for 72 hours at 125°F and 95 percent humidity, then fired 100 rounds.

(2) A cold chamber for 72 hours at -25°F, then fired 100 rounds.

b. Two M14 rifles equipped with test stocks (T-3 and 4) and two M14 rifles equipped with control stocks (C-3 and 6) were exposed to salt water atmosphere for a period of 72 hours.

c. No engineering data being available, test stock (T-3) and control stock (C-1) were subjected to an open flame to determine its effect on the stocks.

d. Test stock (T-8) was exposed to standard insect repellant (6840-290-5027, MIL-R-249B, Type 1 M2020, N140(229)70515B, Lot B1117, manufactured by Octagon Process Inc., Edgewater, N. J.) for a period of 72 hours to determine its effect on the stock.

3. RESULTS.

a. Hot Chamber. No adverse effects were noted on the test stocks. The control stocks developed small cracks in the area of the magazine well and upper sling swivel.

b. Cold Chamber. No adverse effects were noted on either the test or control stocks.

c. Salt Water Atmosphere. No adverse effects were noted on either the test or control stocks; however, all metal parts of both stocks rusted after exposure to salt water.

d. Exposure to Open Flame. The test stock began to blister after 30 seconds and started to burn after 130 seconds of exposure to open flame. The control stocks started to burn after 80 seconds of exposure to open flame.

e. Exposure to Insect Repellent. Small surface blisters developed on the test stocks as a result of exposure to insect repellent. These surface blisters were easily removed by using a fine abrasive.

4. ANALYSIS. Exposure to various adverse conditions had no apparent adverse effect on the test stocks; however, both the test and control stocks burned when exposed to open flame.

TEST NO 6, RETENTION OF HEAT.

1. PURPOSE. To determine and compare the heat retention characteristics of the test and control stocks.

2. METHOD.

a. During the firing portions of Test No 4, the test and control stocks were checked to determine and compare their heat retention characteristics.

b. Two M14 rifles equipped with test stock (T-6) and control stock (C-2) were placed in direct sunlight for 2 hours. Temperature readings were taken from thermometers placed in butt wells of the stocks at the end of 1 hour and 2 hours. The stocks were then allowed to cool until they could be handled comfortably. The time required for each type stock to cool until it could be handled comfortably was determined and compared.

3. RESULTS.

a. The heat retention characteristics of the test and control stocks were as follows:

<u>Stock No</u>	<u>Temp Reading of Thermometer in Butt Well</u>	<u>Temp Reading of Thermometer in Direct Sun Rays</u>	<u>Remarks</u>
<u>After 1 Hour Exposure</u>			
T-6	136°F	108°F	Test stock was too hot to handle.
C-2	120°F	108°F	Control stock could be comfortably handled.
<u>After 2 Hours Exposure</u>			
T-6	157°F	104°F	Test stock was too hot to handle; however, after allowing to cool for 2 minutes the butt well temperature dropped to 120°F and the weapon could be comfortably handled.
C-2	116°F	104°F	Control stock could be comfortably handled. Oils in the control stock were drawn out by the sun.

b. When test stocks were exposed to direct sun rays for 1 hour and 2 hours respectively, they were too hot to handle unless allowed to cool for 2 minutes. However, it was noted throughout all firing that the test stocks were hotter than the control stocks. All firers experienced the increased heat retention of the test stocks; however, while firing, the test stocks were never too hot to cause serious discomfort to the firer.

4. ANALYSIS. The heat retention characteristic of the test stock was considered acceptable.

TEST NO 7, SUITABILITY FOR MOUNTING THE M15 GRENADE SIGHT.

1. PURPOSE. To determine the suitability of the test stocks for mounting the M15 grenade sight.

2. METHOD.

a. Two M15 grenade sights were mounted on two test stocks according to the mounting procedures prescribed for wooden stocks.

b. Fifty M29 practice rifle grenades were fired from each of two M14 rifles equipped with the test stocks prepared in a above.

c. Two M15 grenade sights mounted on the test stocks were each elevated and depressed to the maximum limits 150 times.

d. Fifty practice grenades were fired individually and 200 rounds of M59 ball ammunition were fired in short bursts from each of two M14 rifles equipped with the test stocks mounting the M15 grenade sights as described in a above.

3. RESULTS.

a. No difficulty was encountered when mounting the M15 grenade sights to the test stocks; however, the mounting plate had to be lowered approximately 1/8 inch to prevent the protrusion of the top mounting screw through the stock which prevented the receiver from fitting the stock.

b. There was no apparent loosening of the M15 grenade sight mounting plate at the conclusion of all tests.

c. No adverse effects were noted on the test stocks as a result of mounting the M15 grenade sight.

4. ANALYSIS. In view of the possible requirement to project rifle grenades from the M14 rifle, this additional test was conducted. The test stocks were suitable for mounting the M15 grenade sight.

TEST NO 8. AERIAL DELIVERY.

1. PURPOSE. To determine the suitability of the test stocks to withstand the stress of a parachute landing fall.

2. METHOD. To be included in the addendum to this report of test.

3. RESULTS. To be included in the addendum to this report of test.

4. ANALYSIS. To be included in the addendum to this report of test.

ANNEX B

FINDINGS

This annex includes all deficiencies and shortcomings which are considered significant enough to warrant corrective action, and suggested improvements which are desired to increase quality or performance.

DEFICIENCY/SHORTCOMING

SUGGESTED CORRECTIVE ACTION

REMARKS

SECTION I

This section contains deficiencies requiring elimination in order to make the item acceptable for use on a minimum basis.

Not applicable.

SECTION II

This section lists those deficiencies and shortcomings of the item which were discovered during test and satisfactorily corrected prior to completion of the test. They no longer represent a defect in the item tested. The correction must be applied to the production model of this item.

Not applicable.

SECTION III

This section lists shortcomings which are desired to be corrected as practicable, either concurrent with elimination of the deficiencies in Section I, in production engineering or by Product Improvement.

1. Lack of durability of the bonding.

Strengthen the bonding of the stock.

Test No 4, Annex A.

SECTION IV

SUGGESTED IMPROVEMENTS

REMARKS

This section lists suggested improvements which are not imperative but are desirable to increase quality or performance of the item.

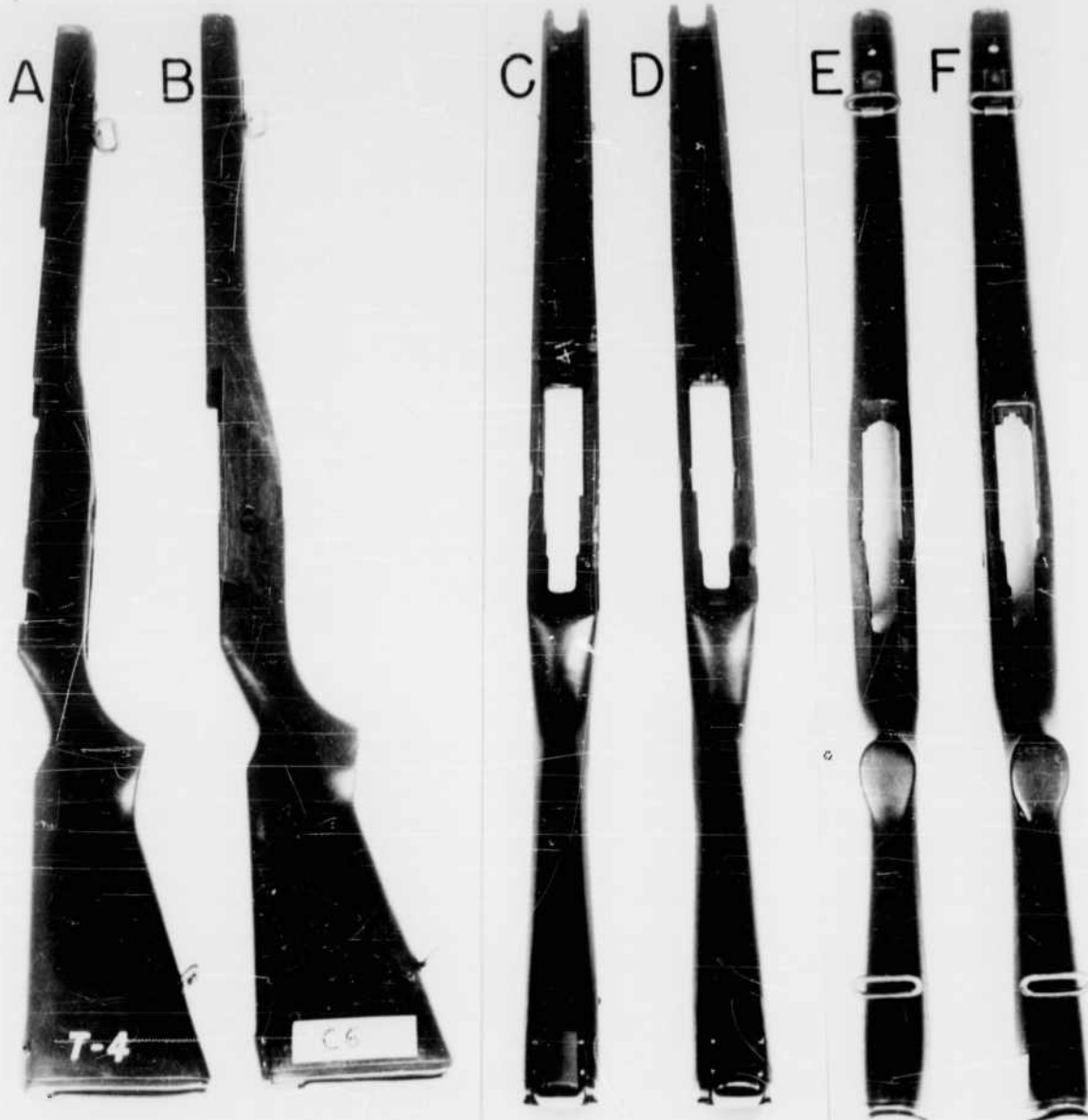
1. Consideration be given to using a finish on the stock that will reduce the heat conductivity presently encountered with the plastic stock.

Test No 6, Annex A.

2.

Consideration be given to improving the finish so that it will not blister and peel when the test stock comes in contact with standard insect repellent.

Test No 5, Annex A.



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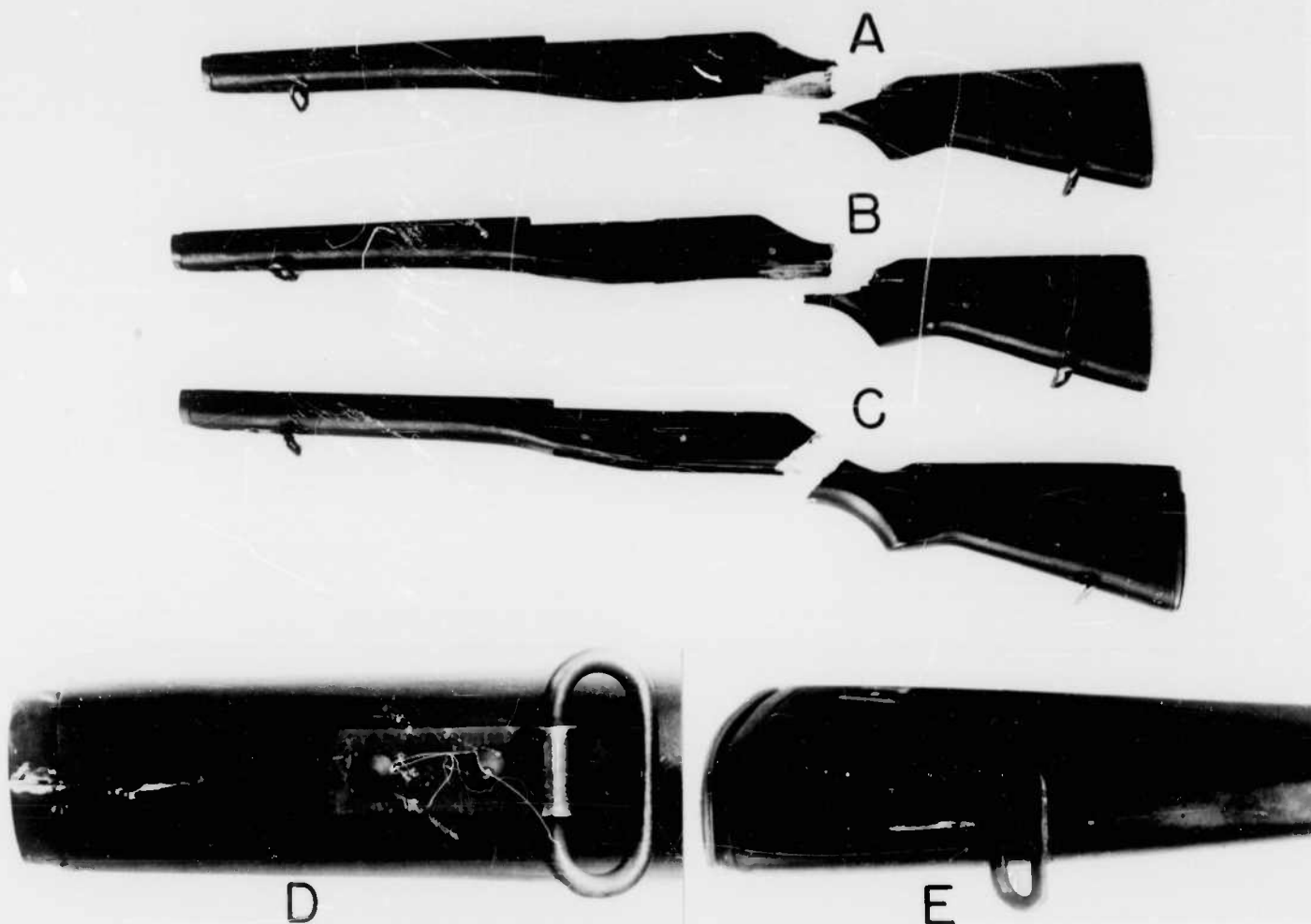
DATE
11 August 1961

NEGATIVE NR
09-166-794/AJ-61

SERVICE TEST OF PLASTIC STOCKS FOR RIFLE, 7.62mm, M14

- A. Plastic Stock (side view)
- B. Wooden Stock (side view)
- C. Plastic Stock (top view)
- D. Wooden Stock (top view)
- E. Plastic Stock (bottom view)
- F. Wooden Stock (bottom view)

ANNEX C-1



UNITED STATES ARMY INFANTRY BOARD
FORT BENNING, GEORGIA

PROJECT NR
2920

DATE
11 August 1961

NEGATIVE NR
09-166-795/AJ-61

SERVICE TEST OF PLASTIC STOCKS FOR RIFLE, 7.62mm, M14

- A. Wooden stock broken by execution of horizontal butt strokes (Stock No C-1).
- B. Wooden stock broken by execution of horizontal butt strokes (Stock No C-2).
- C. Plastic stock broken by execution of horizontal butt strokes (Stock No T-3).
- D. Plastic stock cracked along the bonded seam forward of the upper sling swivel (Stock No T-1).
- E. Plastic stock cracked along the bonded seam between the butt plate and the lower sling swivel (Stock No T-1).

ANNEX C-2